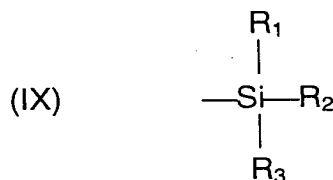


THEREFORE, WE CLAIM:

1. A coating composition formed from components comprising:
 - (a) at least one hydroxyl functional non-vinyl material comprising at least one alcoholic hydroxyl group blocked with a hydrolyzable silyl group; and
 - (b) at least one curing agent reactive with the alcoholic hydroxyl group of the at least one hydroxyl functional non-vinyl material (a).

2. A coating composition according to claim 1, wherein the hydrolyzable silyl group has the following structure (IX):



wherein each R_1 , R_2 and R_3 , which may be identical or different, represents an alkyl group having from 1 to 18 carbon atoms, a phenyl group or an allyl group.

3. A coating composition according to claim 1, wherein compounds which can be reacted with the at least one alcoholic hydroxyl group to form the hydrolyzable silyl group are selected from hexamethyldisilazane, trimethylchlorosilane, trimethylsilyldiethylamine, t-butyl dimethylsilyl chloride, diphenyl methylsilyl chloride, hexamethyl disilylazide, trimethylsilyl triflate, hexamethyldisilyl acetamide, N,N'-bis[trimethylsilyl]-urea, hexamethyldisiloxane, ketene methyl trialkylsilyl acetals, triethylsilyl perchlorate, allylsilanes and mixtures of any of the foregoing.

4. A coating composition according to claim 3, wherein compounds which can be reacted with the at least one alcoholic hydroxyl group to form the hydrolyzable silyl group are selected from hexamethyldisilazanes.

5. A coating composition according to claim 1, wherein at least 1 mole percent of the alcoholic hydroxyl groups of the at least one hydroxyl functional non-vinyl material are blocked with hydrolyzable silyl groups.

5 6. A coating composition according to claim 5, wherein at least 25 mole percent of the alcoholic hydroxyl groups of the at least one hydroxyl functional non-vinyl material are blocked with hydrolyzable silyl groups.

7. A coating composition according to claim 6, wherein at least 33
10 mole percent of the alcoholic hydroxyl groups of the at least one hydroxyl functional non-vinyl material are blocked with hydrolyzable silyl groups.

8. A coating composition according to claim 1, wherein substantially all of the alcoholic hydroxyl groups of the at least one hydroxyl functional non-
15 vinyl material are blocked with hydrolyzable silyl groups.

9. A coating composition according to claim 1, wherein the at least one hydroxyl functional non-vinyl material comprises less than 5 hydroxyl functional groups.

20

10. A coating composition according to claim 1; wherein the at least one hydroxyl functional non-vinyl material has a backbone which comprises at least one linkage selected from an ester linkage, a urethane linkage, a urea linkage, an amide linkage, a siloxane linkage, and an ether linkage.

25

11. A coating composition according to claim 1, wherein the at least one hydroxyl functional non-vinyl material is free of vinyl functional groups.

12. A coating composition according to claim 1, wherein the at least
30 one hydroxyl functional non-vinyl material is a hydroxyl functional polyester.

13. A coating composition according to claim 1, wherein the at least one hydroxyl functional non-vinyl material is formed from components comprising:

- 5 (a) at least one half-ester formed from components comprising:
- (i) at least one polyol; and
 - (ii) at least one anhydride; and
- (b) at least one epoxy functional material or at least one aliphatic diol.

14. A coating composition according to claim 13, wherein the at least one hydroxyl functional non-vinyl material is formed from components comprising:

- (a) at least one half-ester formed from components comprising:
- (i) at least one polyol; and
 - (ii) at least one anhydride; and
- 15 (b) at least one epoxy functional material.

15. A coating composition according to claim 13, wherein the at least one polyol (a)(i) is selected from di-trimethylol propane (bis(2,2-dimethylol)dibutylether), pentaerythritol, 1,2,3,4-butanetetrol, sorbitol, trimethylolpropane, trimethylolethane, 1,2,6-hexanetriol, glycerine, trishydroxyethyl isocyanurate, dimethylol propionic acid, 1,2,4-butanetriol, TMP/epsilon-caprolactone triols, ethylene glycol, 1,2-propanediol, 1,3-propanediol, 1,4-butanediol, 1,5-pentanediol, 1,6-hexanediol, 2-ethyl-1,3-hexanediol, neopentyl glycol, diethylene glycol, dipropylene glycol, 25 1,4-cyclohexanedimethanol, and 2,2,4-trimethylpentane-1,3 diol.

16. A coating composition according to claim 15, wherein the at least one polyol (a)(i) is trimethylolpropane.

30 17. A coating composition according to claim 13, wherein the at least one polyol (a)(i) is selected from polyester polyols and polyurethane polyols.

18. A coating composition according to claim 13, wherein the at least one anhydride (a)(ii) is selected from succinic anhydride, methylsuccinic anhydride, dodecenyl succinic anhydride, octadecenyl succinic anhydride, phthalic anhydride, tetrahydrophthalic anhydride, methyltetrahydrophthalic anhydride, hexahydrophthalic anhydride, alkyl hexahydrophthalic anhydrides, tetrachlorophthalic anhydride, endomethylene tetrahydrophthalic anhydride, chlorendic anhydride, itaconic anhydride, citraconic anhydride, and maleic anhydride.

10 19. A coating composition according to claim 18, wherein the alkyl hexahydrophthalic anhydrides are selected from methylhexahydrophthalic anhydride.

20. A coating composition according to claim 13, wherein the equivalent ratio of acid groups of the at least one anhydride (a)(ii) to hydroxyl groups of the at least one polyol (a)(i) is at least 0.8:1.

21. A coating composition according to claim 13, wherein the at least one epoxy functional material (b) is selected from ethylene oxide, butylene oxide, propylene oxide, cyclohexene oxide, glycidyl esters, and glycidyl ethers.

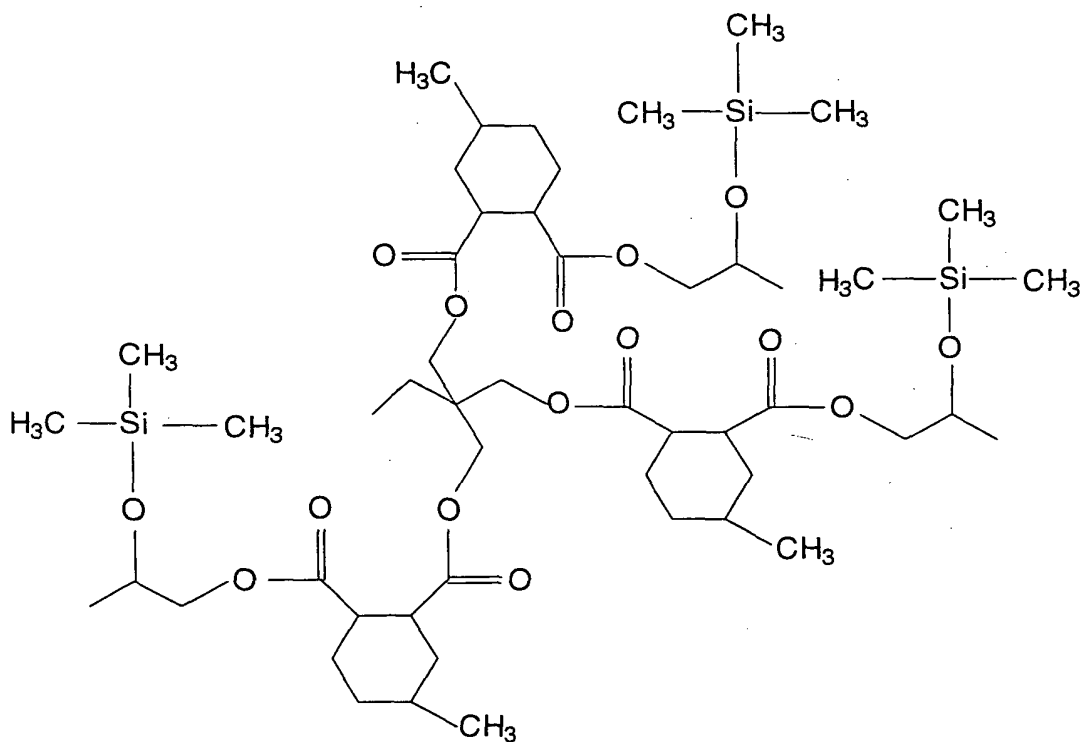
22. A coating composition according to claim 13, wherein the at least one aliphatic diol (b) comprises 1,2-propane diol, ethylene glycol, 1,2-propanediol, 1,3-propanediol, 1,4-butanediol, 1,5-pentanediol, 1,6-hexanediol, 2-ethyl-1,3-hexanediol, neopentyl glycol, diethylene glycol, dipropylene glycol, 1,4-cyclohexanedimethanol, and 2,2,4-trimethylpentane-1,3 diol.

23. A coating composition according to claim 13, wherein the ratio of epoxy groups of the at least one epoxy functional material (b) to acid groups of the at least one anhydride (a)(ii) ranges from 0.1:1 to 1.1:1.

24. A coating composition according to claim 13, wherein the ratio of epoxy groups of the at least one epoxy functional material (b) to acid groups of the at least one anhydride (a)(ii) ranges from 0.5:1 to 1:1.

25. A coating composition according to claim 13, wherein the ratio of epoxy groups of the at least one epoxy functional material (b) to acid groups of the at least one anhydride (a)(ii) ranges from 0.8:1 to 1:1.

26. A coating composition according to claim 1, wherein the at least one hydroxyl functional non-vinyl material comprises at least one compound having the following structure (X):



(X)

15

27. A coating composition according to claim 1, wherein the hydroxyl equivalent weight of the at least one hydroxyl functional non-vinyl material, prior

to silylation, is at least 31 mg KOH per gram of hydroxyl functional non-vinyl material.

28. A coating composition according to claim 1, wherein the
5 hydroxyl equivalent weight of the at least one hydroxyl functional non-vinyl material, prior to silylation, is less than 2000 mg KOH per gram of hydroxyl functional non-vinyl material.

29. A coating composition according to claim 28, wherein the
10 hydroxyl equivalent weight of the at least one hydroxyl functional non-vinyl material, prior to silylation, is less than 1000 mg KOH per gram of hydroxyl functional non-vinyl material.

30. A coating composition according to claim 29, wherein the
15 hydroxyl equivalent weight of the at least one hydroxyl functional non-vinyl material, prior to silylation, is less than 400 mg KOH per gram of hydroxyl functional non-vinyl material.

31. A coating composition according to claim 1, wherein the at least
20 one hydroxyl functional non-vinyl material has a polydispersity of less than 2.

32. A coating composition according to claim 31, wherein the at
least one hydroxyl functional non-vinyl material has a polydispersity of less than
1.5.

25

33. A coating composition according to claim 32, wherein the at
least one hydroxyl functional non-vinyl material has a polydispersity of less than
1.2.

30 34. A coating composition according to claim 1, wherein the at least
one hydroxyl non-vinyl functional material comprising at least one alcoholic
hydroxyl group blocked with a hydrolyzable silyl group, when added to the other

components which form the coating composition, is present in an amount of at least 1 weight percent based on total weight of the resin solids of the components from which the coating composition is formed.

5 35. A coating composition according to claim 1, wherein the at least one hydroxyl functional non-vinyl material comprising at least one alcoholic hydroxyl group blocked with a hydrolyzable silyl group, when added to the other components which form the coating composition, is present in an amount of less than 90 weight percent based on total weight of the resin solids of the
10 components from which the coating composition is formed.

 36. A coating composition according to claim 1, wherein the at least one hydroxyl functional non-vinyl material comprising at least one alcoholic hydroxyl group blocked with a hydrolyzable silyl group, when added to the other
15 components that form the coating composition, is present in an amount ranging from 15 weight percent to 85 weight percent based on total weight of the resin solids of the components from which the coating composition is formed.

 37. A coating composition according to claim 1, wherein the at least
20 one curing agent is selected from aminoplast resins, polyisocyanates, blocked polyisocyanates, triazine derivatives of isocyanates, anhydrides, and polyepoxides.

 38. A coating composition according to claim 1, wherein the at least
25 one curing agent, when added to other components which form the coating composition, is present in the coating composition in an amount ranging from 5 to 95 weight percent based on total weight of the resin solids of the components from which the coating composition is formed.

30 39. A coating composition according to claim 1, wherein the at least one curing agent, when added to other components which form the coating composition, is present in the coating composition in an amount ranging from

15 to 50 weight percent based on total weight of the resin solids of the components from which the coating composition is formed.

40. A coating composition according to claim 1, wherein the at least
5 one curing agent, when added to other components which form the coating composition, is present in the coating composition in an amount of at least 15 weight percent on a basis of total resin solids of the components from which the coating composition is formed.

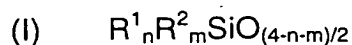
10 41. A coating composition according to claim 1, wherein the components from which the coating composition is formed comprise at least one film-forming material different from component (a).

42. A coating composition according to claim 41, wherein the at least
15 one film-forming material is selected from polyesters, polyurethanes, acrylic polymers, polyamides, and polyethers.

43. A coating composition according to claim 41, wherein the at least
one film-forming material when added to the other components which form the
20 coating composition, is present in an amount ranging from 1 weight percent to 90 weight percent based on total weight of the resin solids of the components from which the coating composition is formed.

44. A coating composition according to claim 1, wherein the
25 components from which the coating composition is formed comprise at least one polysiloxane different from component (a).

45. A coating composition according to claim 44, wherein the at least
polysiloxane different from component (a) comprises at least one of the
30 following structural units (I) :



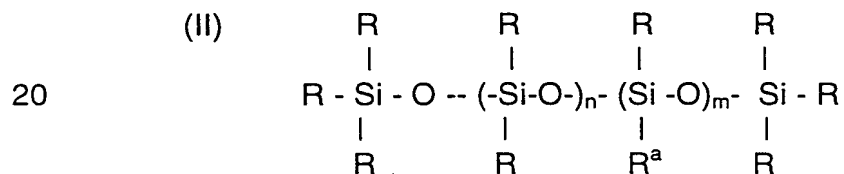
wherein each R^1 , which may be identical or different, represents H, OH, a monovalent hydrocarbon group or a monovalent siloxane group; each R^2 , which may be identical or different, represents a group comprising at least one reactive functional group, wherein m and n fulfill the requirements of $0 < n < 4$,

5 $0 < m < 4$ and $2 \leq (m+n) < 4$.

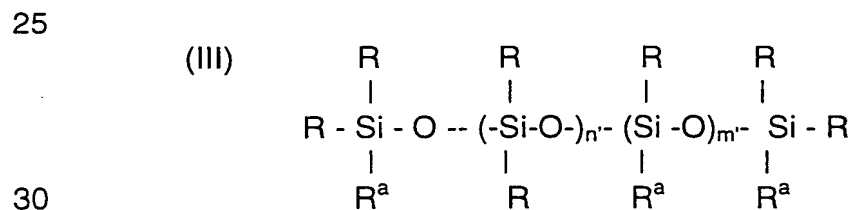
46. A coating composition according to claim 45, wherein each R^2 , which may be identical or different, represents a group comprising at least one reactive functional group selected from a hydroxyl group, a carboxyl group, an isocyanate group, a blocked polyisocyanate group, a primary amine group, a secondary amine group, an amide group, a carbamate group, a urea group, a urethane group, a vinyl group, an unsaturated ester group, a maleimide group, a fumarate group, an anhydride group, a hydroxy alkylamide group, and an epoxy group.

15

47. A composition according to claim 44, wherein the at least one polysiloxane different from component (a) has the following structure (II) or (III):



or



wherein:

m has a value of at least 1;

m' ranges from 0 to 75;

35 n ranges from 0 to 75;

n' ranges from 0 to 75;

each R, which may be identical or different, is selected from H, OH, monovalent hydrocarbon groups, monovalent siloxane groups, and mixtures of any of the foregoing; and

R^a comprises the following structure (IV):

5



wherein R³ is selected from an alkylene group, an oxyalkylene group, an alkylene aryl group, an alkenylene group, an oxyalkenylene group, and an alkenylene aryl group; and

X represents a group which comprises at least one reactive
10 functional group selected from a hydroxyl group, a carboxyl group, an isocyanate group, a blocked polyisocyanate group, a primary amine group, a secondary amine group, an amide group, a carbamate group, a urea group, a urethane group, a vinyl group, an unsaturated ester group, a maleimide group, a fumarate group, an anhydride group, a hydroxy alkylamide group, and an
15 epoxy group.

48. A coating composition according to claim 44, wherein the at least one polysiloxane different from component (a) is present in an amount of 1 to 90 weight percent on a basis of total resin solids of the components from which
20 the coating composition is formed.

49. A coating composition according to claim 1, wherein the components from which the coating composition is formed comprise a plurality of particles, wherein each component is different.
25

50. A coating composition according to claim 49, wherein the particles are selected from inorganic particles, composite particles, and mixtures of the foregoing.

30 51. A coating composition according to claim 50, wherein the particles are selected from fumed silica, amorphous silica, colloidal silica, alumina, colloidal alumina, titanium dioxide, cesium oxide, yttrium oxide,

colloidal yttria, zirconia, colloidal zirconia, and mixtures of any of the foregoing.

52. A coating composition according to claim 51, wherein the particles include colloidal silica.

5

53. A coating composition according to claim 49, wherein the particles are surface treated.

54. A coating composition according to claim 49, wherein the particles have an average particle size of less than 100 microns prior to incorporation into the composition.

10

55. A coating composition according to claim 54, wherein the particles have an average particle size of less than 50 microns prior to incorporation into the composition.

15

56. A coating composition according to claim 55, wherein the particles have an average particle size ranging from 1 to less than 1000 nanometers prior to incorporation into the composition.

20

57. A coating composition according to claim 56, wherein the particles have an average particle size ranging from 1 to 100 nanometers prior to incorporation into the composition.

25

58. A coating composition according to claim 57, wherein the particles have an average particle size ranging from 5 to 50 nanometers prior to incorporation into the composition.

59. A coating composition according to claim 49, wherein the particles, when added to the other components which form the composition, are present in the composition in an amount ranging from 0.01 to 75 weight percent

30

based on total weight of the resin solids of the components from which the coating composition is formed.

60. A coating composition according to claim 1, wherein the
5 components from which the coating composition is formed comprise at least one catalyst.

61. A coating composition according to claim 1, wherein the
components from which the coating composition is formed comprise at least
10 one surface active agent.

62. A coating composition according to claim 1, wherein the
composition when cured has an initial scratch resistance value such that after
scratch testing greater than 40 percent of the initial 20° gloss is retained.
15

63. A coating composition according to claim 1, wherein the
composition when cured has a retained scratch resistance value such that after
scratch testing greater than 30 percent of the initial 20° gloss is retained.

20 64. A cured coating formed from the composition of claim 1.

65. A coated substrate comprising a substrate and a composition
according to claim 1 deposited over at least a portion of the substrate.

25 66. A method for forming a cured coating on a substrate comprising
applying over at least a portion of the substrate a coating composition
according to claim 1.

67. A method according to claim 66, wherein the substrate is an
30 automotive substrate.

68. A coated automobile substrate comprising an automobile substrate and a composition according to claim 1 deposited over at least a portion of the automobile substrate.

5 69. A coated automobile substrate according to claim 68, wherein the automobile substrate is a bumper.

70. A coated automobile substrate according to claim 68, wherein the automobile substrate is a hood.

10

71. A coated automobile substrate according to claim 68, wherein the automobile substrate is a door.

72. A coated automobile substrate according to claim 68, wherein the
15 automobile substrate is a fender.

73. A multi-component composite coating composition comprising a basecoat deposited from a pigmented coating composition, and a composition according to claim 1 applied over at least a portion of the basecoat.

20

74. A multi-component composite according to claim 73, wherein the composition is a topcoat.

75. A multi-component composite according to claim 73, wherein the
25 composition is transparent after curing.

76. A method for making a multi-component composite comprising:
(a) applying a pigmented composition to a substrate to form a
basecoat;

30 (b) applying a topcoating composition according to claim 1 over at least a portion of the basecoat; and

 (c) curing the topcoating composition to form a cured coating.

77. A coating composition formed from components comprising:
(a) at least one hydroxyl functional material comprising at least one hydroxyl group blocked with a hydrolyzable silyl group, the hydroxyl functional
5 material having a polydispersity of less than 2; and
(b) at least one curing agent reactive with the at least one hydroxyl group of (a).

78. A coating composition according to claim 77, wherein the
10 hydroxyl functional material having a polydispersity of less than 1.5.

79. A coating composition according to claim 78, wherein the hydroxyl functional material having a polydispersity of less than 1.2

15 80. A coating composition formed from components comprising:
(a) at least one hydroxyl functional material comprising at least one hydroxyl group blocked with a hydrolyzable silyl group, the hydroxyl functional material having less than 5 hydroxyl functional groups; and
(b) at least one curing agent reactive with the at least one hydroxyl
20 group of (a).

81. A coating composition formed from components comprising:
(a) at least one hydroxyl functional material comprising at least one hydroxyl group blocked with a hydrolyzable silyl group; and
25 (b) at least 10 weight percent on a basis of total resin solids of the components which form the coating composition of at least one curing agent reactive with the at least one hydroxyl group of (a).

82. A coating composition formed from components comprising:

(a) at least one carbamate functional material comprising at least one carbamate group blocked with a hydrolyzable silyl group; and

5 (b) at least one curing agent reactive with the at least one carbamate group of (a).

83. A coating composition formed from components comprising:

(a) at least one carboxyl functional non-vinyl material comprising at least one carboxyl group blocked with a hydrolyzable silyl group; and

10 (b) at least one curing agent reactive with the at least one carboxyl group of (a).

84. A coating composition formed from components comprising:

(a) at least one amide functional non-vinyl material comprising at
15 least one amide group blocked with a hydrolyzable silyl group; and

(b) at least one curing agent reactive with the at least one amide group of (a).